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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/972,223	10/05/2001	Mitchell Rosen	1819/100211	4639

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EXAMINER

WU, JINGGE

ART UNIT PAPER NUMBER

2623

DATE MAILED: 07/27/2004

18

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/972,223

Applicant(s)

ROSEN ET AL.

Examiner

Jingge Wu

Art Unit

2623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 May 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35,37-39,41 and 42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1,3-6,14,18,21,22,24-26,32 and 42 is/are rejected.
- 7) ☐ Claim(s) 2 and 23 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Response to Amendment

1. Applicants' response to the last Office Action, filed May 14, 2004 has been entered and made of record.
2. Applicants' amendment has required new grounds of rejection. New grounds rejection are therefore presented in the Office Action.
3. In responding to the request of the status of claims 27 and 41, Examiner believed that the indication of claim 41 is allowed in the action summary is correct because claim 41 depend from allowed claim 37, and the indication of claim 27 is rejected in the paper #15 is in corrected. Thus, the status of claim 27 is objected and the status of claim 41 is allowed.

Remarks

4. Applicant's arguments with respect to claims 1 and 22 have been fully considered, but they are not persuasive.
 - a. Applicant argues that Maitre does not determining the smallest number of filters which would obtain a good reconstruction because he aimed at "to reconstruct as precisely as possible the spectral reflectance curve using more than three filters." And the present invention does not just identify the set with smallest number of channels, but determines the set with the smallest number of channels which also satisfy the chosed error criterion. Thus, Maitre does not teach or suggest the claimed language.

Examiner disagrees. Examiner would like to point out that claim language is given its broadest reasonable interpretation. In the instant case, \first, Maitre clearly

show that determining optimal filters to reconstruct the color paint as precisely as possible under a error criterion (equation 10 or 11). Here, the error criterion is "as precise as possible", and optimal filters are the smallest sub set to reconstruct the paint under the error criterion. Mentioned three filters could only be used to the paint but far less precise. Only the method of Maitre could be use smallest (optimal) filters to do the job under the error criterion ((as precise as possible). In addition, Examiner believes that Maitre's teaching can be read on claim language that determining a smallest number of the plurality of channels which can be used o reconstruct image to satisfy a first error criterion because claim language does not ask to determine absolutely smallest channels but rather **the smallest channels to satisfy a first error criterion**, which is the teaching of Maitre. Therefore, regardless how many filters Maitre used (10-12 filters), he determines the number of the filters are smallest set of filters under the error criterion, which is read on the claim language.

b. Applicant further argues that there is no motivation to combine Berns and Maitre because there is no need for using Maitre's method.

However, in response to applicant's argument, Examiner would like to point out that claim language is given its broadest reasonable interpretation. One can not show non-obviousness by attacking references individually where, as here the rejection are based on combination reference. In re Keller, 208 USPQ 871 (CCPA 1981). Also the test for obviousness is not whether the features of the reference may be bodily incorporated into the other to produce the claimed subject matter but simply what the references make obvious to one of ordinary skill in the art. In Re Bozek, 163 USPQ 545, (CCPA 1969); In re Richman 165 USPQ 509, (CCPA 1970); In re Beckum, 169 USPQ 47(CCPA 1971); In re Sneed, 710 F.2d 1544, 218 USPQ 385.

Maitre is cited to show that using a first error criterion to choose optimal channel to reconstruct image is well known. In addition, Maitre and Bern are in same field, particularly in reconstruct high spectral image. Furthermore, Maitre mentions the possible motivation to use his scheme in page 50 i.e., provide most adequate way to reconstruct a hyperspectral image such as painting as precisely as possible while using minimum numbers of color filters. Thus, Maitre provides motivation to combine with Berns.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 3-6, 14, 18, 22, 24-26, and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over the article "Multi-spectral color reproduction research at the Munsell Color Science Laboratory" to Berns et al. (a reference of record) in view of the article "Spectrophotometric image analysis of fine art paintings" to Maitre et al. (a reference of record)

As to claim 1, Berns discloses a method for spectral imaging, comprising:
capturing high spectral resolution data of at least a first portion of a first scene using a first plurality of channels (page 16, section 3, note that the first plurality of channels could be 61 channels);

determining a first set of channels (minimum number of channels) from a second plurality of channels which can reconstruct spectral of the first portion of first scene (page 16, section 3, page 18) to satisfy a first error criterion when compared with the captured high spectral resolution data (Fig. 1, page 15-17, section 3, note that the error criterion is the least-square, see page 17, formula 3); and

capturing pixel data of at least a second portion of at least first scene using the first set of channels (page 16-18, section 3, note that capturing or reconstructing at least a portion of pixel data is inherent when the portion of the image is reconstructed).

Even if , for the sake of argument, Berns does not explicitly mention the error criterion is used for choosing channels (filters, note that Berns mentions choosing minimum channels) .

Maitre, in an analogous environment, discloses using a error criterion(equation 10 or 11) to choose optimal channels (filters) , wherein the first set of channels comprises a smallest number of the plurality of channels (minimum channels) which can be used to reconstruct spectral of the first portion of the first scene to satisfy a first error criterion when compared with the captured high spectral resolution data (page 16, section 3, note that the error criterion is the least-square, Maitre, abstract).
(page 52-53, abstract, see remark).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the scheme of Maitre in the method of Berns in order to use minimal necessary channels (filters) to reconstruct the spectral image (Matre, page 50 and abstract).

As to claim 3, Berns further discloses the data of the channels are stored (Fig. 1), other limitations are discussed with regard to claim 1.

As to claims 4-6, Berns further discloses determining a first transform from the first set of channels and using the transform to reconstruct image spectra (Fig. 1, page 16, section 3, note that equations 1 and 2 are transforms, the storing the transform is inherent), other limitations are addressed with regard to claim 1.

As to claims 14, Berns further discloses storing the captured pixel data (Fig. 1).

As to claim 18, Berns further discloses the first error criterion requires that the reconstructed spectra of the first portion of the first scene be within a first error tolerance or the reconstructed spectra be associated with a minimum value for predetermined metric when compared with the captured high spectral resolution data (Fig. 3, page 16-17, section 3, note that the error criterion is the least-square).

As to claims 22, 24-26, the claims are corresponding system claims to claims 1, 3-6. The discussions are addressed with regard to claims 1-6.

As to claim 42, Berns further discloses the imaging system comprising:

a first imaging system that captures the high spectral resolution data (page 18-19) of at least portion of the first scene using the plurality of channels (Fig. 1, page 15-17); and

a second imaging system captures the pixel data of the scene using the first set of channels (Fig. 1, page 15-17).

7. Claims 21, and 32, are rejected under 35 U.S.C. 103(a) as being unpatentable over Berns and Maitre in view of US 5949914 to Yuen.

As to claims 21 and 32, Berns dose not explicitly mention the number of first and second channels or subsystems are identical.

Yuen, in an analogous environment, discloses using multiple identical channels or sub-imaging systems (Fig. 9a).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the scheme of Yuen in the method of Berns in order to increase the resolution of the multi-spectral image data (Yuen, col. 2 lines 3-12).

Allowable Subject Matter

8. Claims 2 and 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 7, 20, 27 are allowed. Claims 8-13, 15-17 and 19 depend from claim 7, therefore, are allowed. Claims 28-31 depend from claim 27, therefore, are allowed.

Claims 33 and 37 are allowed. Claims 34-35 and claims 38-39 and 41 depend from claims 33 and 37 respectively are, therefore, allowed.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications should be directed to Jingge Wu whose telephone number is (703) 308-9588. He can normally be reached Monday through Thursday from 8:00 am to 5:30 pm. The examiner can be also reached on second alternate Fridays.

Any inquiry of a general nature or relating to the status of this application should be directed to TC customer service whose telephone number is (703) 306-0377.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Amelia Au, can be reached at (703) 308-6604.

The Working Group Fax number is (703) 872-9314.

Jingge Wu

Primary Patent Examiner

